



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

## NOTICE OF ALLOWANCE AND FEE(S) DUE

41838 7590 03/17/2008

GENERAL ELECTRIC COMPANY (PCPI)  
C/O FLETCHER YODER  
P. O. BOX 692289  
HOUSTON, TX 77269-2289

EXAMINER

THANGAVELU, KANDASAMY

ART UNIT

PAPER NUMBER

2123

DATE MAILED: 03/17/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/707,656

12/30/2003

James Kenneth Aragonese

RD28217-4

1655

TITLE OF INVENTION: SYSTEM AND METHOD FOR DIAGNOSING FAULTS UTILIZING BASELINE MODELING TECHNIQUES (GERD-0389)SWA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	06/17/2008

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

#### I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax** (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

41838 7590 03/17/2008

GENERAL ELECTRIC COMPANY (PCPI)  
 C/O FLETCHER YODER  
 P. O. BOX 692289  
 HOUSTON, TX 77269-2289

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/707,656 12/30/2003 James Kenneth Aragonés RD28217-4 1655

TITLE OF INVENTION: SYSTEM AND METHOD FOR DIAGNOSING FAULTS UTILIZING BASELINE MODELING TECHNIQUES (GERD-0389)SWA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	06/17/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
THANGAVELU, KANDASAMY	2123	703-008000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,656	12/30/2003	James Kenneth Aragones	RD28217-4 (GERD-0399)SWA	1655
41838	7590	03/17/2008	EXAMINER	
GENERAL ELECTRIC COMPANY (PCPI) C/O FLETCHER YODER P. O. BOX 692289 HOUSTON, TX 77269-2289			THANGAVELU, KANDASAMY	
			ART UNIT	PAPER NUMBER
			2123	
			DATE MAILED: 03/17/2008	

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 521 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 521 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

**Notice of Allowability**

Application No.

10/707,656

Examiner

KANDASAMY THANGAVELU

Applicant(s)

ARAGONES, JAMES KENNETH

Art Unit

2123

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to February 11, 2008.
2. ☒ The allowed claim(s) is/are 1-41.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                     |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date ____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date ____     | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                   |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|  | 9. <input checked="" type="checkbox"/> Other <u>Clean copy of Allowed claims</u> .    |

## **DETAILED ACTION**

### ***Introduction***

1. This communication is in response to the Applicants' communication dated February 11, 2008. Claims 4, 7, 8, 10, 12, 15, 19, 26, 30, 34, 40 and 41 were amended. Claims 1-41 of the application are pending.

### ***Examiner's Amendment***

2. Authorization for this examiner's amendment was given in a telephone conversation by Mr. Tait Swanson on February 25, 2008.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to the applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

3. In the claims in the amendment dated February 11, 2008:

In Claim 1, Lines 8-9, "similarities in engine operating parameters"  
has been changed to

-- similarities in data of engine operating parameters --.

In Claim 1, Line 13, “at least one aspect of engine baseline model”

has been changed to

-- the engine performance variables as functions of the engine operating parameters as related by the engine baseline model for a group --.

In Claim 7, Line 1, “claim 6, wherein a preprocessor maps”

has been changed to

-- claim 8, wherein the preprocessor maps --.

In Claim 8, Line 1, “claim 1, wherein a preprocessor comprises”

has been changed to

-- claim 1, further comprising a preprocessor that comprises --.

In Claim 10, Lines 1-3, “claim 1, wherein the engine baseline modeling component comprises a heuristics component that generates rules for cleaning a preprocessed data”

has been changed to

-- claim 7, wherein the engine baseline modeling component comprises a heuristics component that generates rules for cleaning the preprocessed data --.

In Claim 12, Lines 5-6, “similarities in engine operating parameters”

has been changed to

-- similarities in data of engine operating parameters --.

Art Unit: 2123

In Claim 12, Line 7, “data element was measured”

has been changed to

-- data was measured --.

In Claim 12, Lines 12-13, “identify engine quality, or design a new engine system, or a combination thereof”

has been changed to

-- or identify engine quality, or a combination thereof --.

In Claim 18, Line 1, “claim 17, further comprising mapping”

has been changed to

-- claim 19, further comprising mapping --.

In Claim 21, Line 1, “method of claim 12”

has been changed to

-- method of claim 18--.

In Claim 23, Line 8, “similar engine operating parameters”

has been changed to

-- similarities in data of engine operating parameters --.

In Claim 23, Line 9, “data element was measured”

has been changed to

-- data was measured --.

Art Unit: 2123

In Claim 23, Line 15, “identify engine quality, or design a new engine system, or a combination thereof”

has been changed to

-- or identify engine quality, or a combination thereof --.

In Claim 24, Line 1, “The computer-readable medium”

has been changed to

-- computer-readable storage medium --.

In Claim 25, Line 1, “The computer-readable medium”

has been changed to

-- computer-readable storage medium --.

In Claim 26, Line 1, “The computer-readable medium”

has been changed to

-- computer-readable storage medium --.

In Claim 27, Line 1, “computer-readable medium of claim 25”

has been changed to

-- computer-readable storage medium of claim 26--.

In Claim 28, Line 1, “The computer-readable medium”



Art Unit: 2123

has been changed to

-- computer-readable storage medium --.

In Claim 29, Line 1, “computer-readable medium of claim 28”

has been changed to

-- computer-readable storage medium of claim 30--.

In Claim 30, Lines 1-2, “computer-readable medium of claim 23, wherein the instructions for processing further comprise”

has been changed to

-- computer-readable storage medium of claim 23, wherein the instructions for processing in the preprocessor further comprise --.

In Claim 31, Line 1, “The computer-readable medium”

has been changed to

-- computer-readable storage medium --.

In Claim 32, Line 1, “computer-readable medium of claim 23”

has been changed to

-- computer-readable storage medium of claim 29--.

In Claim 33, Line 1, “The computer-readable medium”

Art Unit: 2123

has been changed to

-- computer-readable storage medium --.

In Claim 34, Lines 4-5, “similarities in engine operating conditions”

has been changed to

-- similarities in data of engine operating parameters --.

In Claim 34, Line 9, “engine operating conditions”

has been changed to

-- engine operating parameters --.

In Claim 34, Line 10, “outputting at least one aspect of the engine baseline model for display on a monitor”

has been changed to

-- displaying the engine performance variables as functions of the engine operating parameters as related by the engine baseline model for a group --.

In Claim 35, Line 6, “segmenting the engine data into a plurality of groups”

has been changed to

-- instructions for segmenting the engine data into a plurality of groups representative of different clusters of similar data of engine operating parameters comprising altitude, air speed, air temperature, fuel specific heat value, air humidity, control settings or a combination thereof--.

In Claim 35, Lines 10-11, “instructions for outputting at least one aspect of the engine baseline model for display on a monitor”

Art Unit: 2123

has been changed to

-- instructions for displaying the engine performance variables as functions of the engine operating parameters as related by the engine baseline model for a group --.

In Claim 39, Lines 1-2, "a cluster of similar engine operating parameters"

has been changed to

-- a cluster of similar data of engine operating parameters --.

In Claim 40, Lines 1-2, "groups are representative of different clusters of similar engine operating parameters"

has been changed to

-- groups are representative of different clusters of similar data of engine operating parameters --.

In Claim 41, Lines 1-2, "computer-readable medium of claim 23, wherein the plurality of groups are representative of different clusters of similar engine operating parameters"

has been changed to

-- computer-readable storage medium of claim 23, wherein the plurality of groups are representative of different clusters of similar data of engine operating parameters --.

**A clean copy of allowed claims is attached.**

***Reasons for Allowance***

4. Claims 1-41 of the application are allowed over prior art of record.
5. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

The closest prior art of record shows:

(1) a system for monitoring various performance parameters of a gas turbine engine and comparing them with predicted values to identify the deviations indicative of the condition of the engine; system sensors detect current values of engine operating and performance data; equipment on the aircraft periodically record the various engine performance parameters during periods of aircraft operation; these data are transmitted to the ground based monitoring station and stored in tapes; the data are conditioned by filtering techniques to remove noise and normalize the data for further computer analysis; statistical analysis is performed for estimating the dependent engine parameters using linear regression; dependent performance parameters such as rotational speed of the compressor stage, fuel flow rate, engine pressure ratio, exhaust gas temperature are determined as functions of independent parameters using linear regression analysis techniques; independent engine parameters include mach numbers, altitudes, throttle positions, air temperature etc.; the current values of engine operating parameters are used to predict expected engine performance parameters using the regression equations; the monitored actual values of the performance parameters are compared with predicted values to determine the

Art Unit: 2123

deviations which are used to identify the faulty operating conditions (**Bernier et al.**, U.S. Patent 4,215,412);

(2) engine data from an airplane are sampled at different times and transmitted to ground stations; the data are preprocessed and analyzed by a trend analysis tool; the tool monitors several engine variables and compares them against trending baseline data; if the data for a particular variable exceeds a predetermined threshold limit, the tool issues an alert; multivariate clustering is used to classify the normalized data in a multi-dimensional space defined for the process variables; the normalized data are classified into a cluster indicative of normal operating conditions and one or more alert clusters indicative of alert conditions; the boundaries of the clusters are non crisp, such that the degree of membership for a cluster is largest at the center; a tracker is used for addressing drifting data sets that arise in the process over time; an alert verifier verifies the correlated data classified as alert condition; the multivariate generator is used in parallel with the trend performance analysis tool to validate the alerts generated (**Goebel et al.**, U.S. Patent 6,216,066); and

(3) a method and system for simultaneously monitoring and visually displaying a plurality of performance parameters of an aircraft engine during operation; the displayed performance parameters permit a pilot to make operational changes in thrust or power based on engine performance parameters; the operating conditions of the engine are monitored as digital signals and stored in a computer memory; an ideal function model of the engine is used to calculate or predict the available and predicted thrust of the ideal engine; given an engine performance parameter, a reasonable approximation of the actual characteristics of the engine is obtained using a multiple regression model; the predicted thrust of the ideal engine under same

Art Unit: 2123

operating conditions is obtained using the model; the actual and the predicted performance parameters are compared and the difference between the two determined; the difference of the parameters is used to identify normal, caution and warning ranges (**Abbott et al.**, U.S. Patent 5,050,081).

None of these references taken either alone or in combination with the prior art of record discloses a system for building an engine baseline model for fuel-powered engines, specifically including:

(Claim 1) “a data segmenting component that segments the engine data into a plurality of groups, and each group clusters a portion of the engine data based on similarities in data of engine operating parameters, based on each specific engine, and based on time periods of data acquisition; and

an engine baseline modeling component that builds an engine baseline model for each of the plurality of groups using regression analysis, wherein the regression analysis relates engine performance variables as functions of the engine operating parameters” in combination with the remaining elements and features of the claimed invention.

None of these references taken either alone or in combination with the prior art of record discloses a computer implemented method for building an engine baseline model for fuel-powered engines, specifically including:

(Claim 12) “processing the engine data into a predetermined format in a preprocessor, wherein the processing includes segmenting the engine data into a plurality of groups based upon

similarities in data of engine operating parameters, based on each specific engine and further based upon specific time periods during which each data was measured;

building an engine baseline model for each of the plurality of groups using regression analysis, wherein the regression analysis relates engine performance variables as functions of the engine operating parameters” in combination with the remaining elements and features of the claimed invention.

None of these references taken either alone or in combination with the prior art of record discloses a computer-readable storage medium incorporating computer instructions which when executed on a computer perform a process for building an engine baseline model for fuel-powered engines, specifically including:

(Claim 23) “instructions for processing the engine data into a predetermined format in a preprocessor, wherein the instructions for processing include instructions for segmenting the engine data into a plurality of groups based upon similarities in data of engine operating parameters, and further based upon specific time periods during which each data was measured;

instructions for building an engine baseline model for each of the plurality of groups using regression analysis, wherein the regression analysis relates engine performance variables as functions of the engine operating parameters” in combination with the remaining elements and features of the claimed invention.

None of these references taken either alone or in combination with the prior art of record discloses a computer implemented method for building an engine baseline model for combustion-based engines, specifically including:

(Claim 34) “clustering the engine data into a plurality of groups each based on similarities in data of engine operating parameters, based on each specific engine, and based on time periods of data acquisition;

building an engine baseline model for each of the plurality of groups using regression analysis, wherein the regression analysis relates engine performance variables as functions of the engine operating parameters” in combination with the remaining elements and features of the claimed invention.

None of these references taken either alone or in combination with the prior art of record discloses a computer-readable storage medium incorporating computer instructions, which when executed on a computer perform a process for building an engine baseline model for combustion-based engines, specifically including:

(Claim 35) “instructions for segmenting the engine data into a plurality of groups representative of different clusters of similar data of engine operating parameters comprising altitude, air speed, air temperature, fuel specific heat value, air humidity, control settings or a combination thereof;

instructions for building an engine baseline model for each of the plurality of groups using regression analysis, wherein the regression analysis relates engine performance variables



Art Unit: 2123

as functions of engine operating parameters” in combination with the remaining elements and features of the claimed invention.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance.”

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez, can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

Art Unit: 2123

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K. Thangavelu  
Art Unit 2123  
February 25, 2008

/Paul L Rodriguez/  
Supervisory Patent Examiner, Art Unit 2123